AGENDA: February 10, 2004 **7.2**

CATEGORY: New Business

DEPT.: Public Works

TITLE: Landfill Gas Electricity Generation Proposals—Approve Project Selection

RECOMMENDATION

Authorize the City Manager or his designee to negotiate and enter into a landfill gas sales agreement with the Alza Corporation.

FISCAL IMPACT

Alza's proposal includes a price of $0.049 per therm for landfill gas and would result in revenue of approximately $193,500 annually based on consumption of 1,795 standard cubic feet per minute (scfm). Ameresco's proposal includes a price of $0.035 per therm for landfill gas and would generate approximately $152,000 annually based on consumption of up to 1,800 scfm.

All construction, equipment costs and administrative costs will be borne by Alza or Ameresco as part of the proposals.

BACKGROUND AND ANALYSIS

The City maintains and operates a gas collection system for approximately 750 acres of closed landfill in the North Bayshore Area. Gas produced from the landfill contains 45 percent to 50 percent methane and is a suitable fuel source for electricity-producing generators. From 1986 to 1996, the City sold landfill gas to Laidlaw Gas Recovery Systems to power an electricity generation facility. Located in the northeast corner of the Crittenden landfill, the facility ceased operation in 1996 due to declining revenues and the City's lease of the land to Silicon Graphics, Inc. Since 1996, all landfill gas has been incinerated at the flare station located in Shoreline park behind the Amphitheatre.

For several years, the Technology Committee and City staff have explored various options to convert the landfill gas to a beneficial use. Although two microturbines are being installed to provide power to City facilities in the Shoreline park area, the volatility of the energy market and risk associated with various proposals precluded the development of large-scale projects. There are currently two viable projects that staff is presenting to the Council for consideration.

In late 2002, staff began working with the Alza Corporation (a subsidiary of Johnson & Johnson) regarding a potential project to generate electricity for Alza's facilities in the North Bayshore Area. Since expressing interest, Alza staff and their consultants have been working to refine and expand their proposal. In October 2003, City of Palo Alto representatives contacted the City regarding an additional energy production proposal. Ameresco Energy Services, a consulting and design firm working with Palo Alto, is proposing to build and operate a landfill gas-powered generation facility in Palo Alto near Terminal Boulevard and San Antonio Road.

Staff presented both proposals to the Technology Committee at a January 6, 2004 meeting. (The meeting minutes are included as Attachment 1.) After reviewing the information, the Committee discussed their primary objectives of maximizing gas consumption and power generation, and initiating generation as soon as possible. The Committee requested Alza explore the possibility of generating and distributing a greater amount of energy, possibly to nearby companies. Alza staff attending the meeting indicated they would explore project alternatives, and the Committee provided additional time to Alza and Ameresco to refine the proposals to meet the Committee's goals. Both parties submitted revised proposals, and the operational, financial and energy production parameters of the projects are presented below. Both proposals meet the project objectives established by the Committee.

Landfill Gas Project Proposals

Alza Corporation

Alza is proposing to install landfill gas-powered generators to supply electricity at four North Bayshore Area sites. The generators would provide power to buildings and waste heat would be used in absorption chillers and to provide heated water. Alza plans on using one 1.36 megawatt (MW) generator, two 1.0 MW generators and one 800 kilowatt generator, each operating 24 hours per day. Alza would use approximately two-thirds of the electricity produced by the system; the excess energy would be sold to PG&E for use by other customers. Alza also plans to convert a thermal oxidizer to use landfill gas, rather than natural gas (the thermal oxidizer is used to destroy volatile organic chemicals generated in Alza's manufacturing process).

Alza's project would be fully implemented by early 2006 with a majority of generation on-line by 2005. A pipeline to supply landfill gas to Alza would run from the City's flare station, west to Permanente Creek and south to the Charleston Road site. Alza's preliminary plan for additional distribution pipelines in the North Bayshore Area is illustrated in Attachment 4. The majority of the proposed alignment south of the landfill is on Alza's property. Alza's proposal is included as Attachment 2.

City of Palo Alto

In October 2003, City of Palo Alto representatives contacted the City regarding an energy production proposal. Ameresco Energy Services, a consulting firm working with Palo Alto, is proposing to build and operate a generation facility in Palo Alto near Terminal Boulevard and San Antonio Road to generate electricity for Palo Alto's electric utility. Current State laws prohibit Palo Alto from selling electricity to Mountain View through direct access.

Ameresco plans to begin generating 5.4 MW of electricity in 2005, continuing for five years. Generation capacity would decrease to 5.0 MW from 2010 through 2014, followed by a decrease to 3.0 MW to 4.0 MW from 2015 forward. The project would require construction of a gas supply line from the flare station, along the PG&E access road and across Terminal Boulevard, to the generation site. Electricity would be transferred to Palo Alto's grid located a few hundred feet from the facility. The majority of the pipeline would be installed on Mountain View's property and Terminal Boulevard, and the preliminary pipeline alignment is illustrated in Attachment 4. Ameresco's proposal is included as Attachment 3.

Landfill Gas Project Comparisons

Power Generation

Alza's proposal would use 1,664 scfm for electricity generation and 131 scfm to power the thermal oxidizer. Based on Alza's generation capacity and estimated on-line time of 93 percent, the system would generate up to 33,890,700 kilowatt hours annually and replace up to 750,000 therms of natural gas. Assuming estimated landfill gas generation of 1,800 scfm, staff anticipates Alza's energy needs would consume all available gas.

Ameresco proposes using up to 1,800 scfm of landfill gas to produce a maximum of 5.4 megawatts of electricity. Based on Ameresco's capacity and estimated on-line time of 95 percent, the system would generate up to 44,938,800 kilowatt hours annually. Assuming estimated landfill gas generation of 1,800 scfm, staff anticipates Ameresco using all available gas for energy production.

Both projects can be scaled to match gas availability at the time of construction, and Alza and Ameresco have factored declining future gas production into their proposals. Staff will ensure availability of an adequate gas supply to fuel the two microturbines being installed in Shoreline park as well as gas needed for power production at the planned Shoreline maintenance facility. Energy production and gas consumption information is included in Attachment 5.

Pollution Reductions

Using landfill gas to generate electricity will yield emissions benefits by replacing electricity and natural gas generated from traditional sources. To compare the benefits of each proposal, staff computed theoretical emissions produced from conventional energy generation using U.S. Department of Energy figures. Alza's proposal would yield CO_2 reductions of 5,168 tons from electricity generation and an additional 4,387 tons from natural gas displacement for a total of 9,555 tons. Ameresco's proposal would yield reductions of 6,853 tons from electricity generation. Emissions reduction data is provided in Attachment 6.

SUMMARY/NEXT STEPS

After reviewing the proposals, staff considers both to be viable and beneficial. Alza's project will provide greater financial benefits to the City and yield higher emissions reduction while Ameresco's system produces more electricity and is the most straightforward construction option due to the concept of centralized generation.

The City has a history of partnering with local companies on projects of mutual benefit. Based on the energy replacement benefits and emissions reductions as well as the higher revenue, staff recommends approving Alza's proposal to construct an energy-generation system and provide renewable energy to a local business. Assuming Council approval, staff will begin negotiating the terms of a landfill gas sales agreement and construction schedule with Alza representatives.

PUBLIC NOTICING—Agenda posting.

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Attachments:
1. January 6, 2004 Technology Committee Meeting Minutes
2. Alza Corporation Project Proposal
3. Ameresco Corporation Project Proposal
4. Proposed Landfill Gas Line Location
5. Alza and City of Palo Alto Project Comparison
6. Project Emissions Reduction Estimates

cc: Mr. Scott G. Colpitts, Alza Corporation

Mr. Karl Knapp, City of Palo Alto

Ms. Linda M. Nutting, Ameresco Energy Services